DOCUMENT RESUME

ED 443 400 IR 020 278

AUTHOR Flannelly, Susanne
TITLE Improving Middle School Educators' Computer Application Skills through a Staff Training Program.
PUB DATE 1998-00-00
NOTE 90p.; Ed.D. Practicum I Report, Nova Southeastern University.
PUB TYPE Dissertations/Theses - Practicum Papers (043) -- Tests/Questionnaires (160)
EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Computer Assisted Instruction; Computer Literacy; Computer Software; *Computer Uses in Education; Educational Technology; *Faculty Development; Internet; Middle School Teachers; Middle Schools; *Staff Development; Teaching Methods; Training; Workshops

ABSTRACT

This practicum involved a series of continuous staff training sessions that provided teachers with the skills and knowledge necessary to implement the use of computers in the classroom. The 14 workshops and 3 inservice days focused on using the computer for: classroom management skills, evaluating software for instructional use, CD-ROM instruction, and Internet training. All sessions emphasized the development of useful projects that related directly to the educational environment. In addition, workshop attendees were provided with mentors to assist them with the inclusion of computer use in their instruction. Inservice day sessions were provided by technology-savvy teachers who use technology in their classrooms. The author, a computer teacher and presentor at numerous state and national technology conferences, presented workshops. The results of the practicum revealed that, after completion of the workshop and inservice sessions, teachers possessed the skills and confidence necessary to include computers in their instruction. The Needs Assessment Questionnaire, Performance Evaluation Checklist and Software and Workshop Evaluation Forms are appended. (Contains 55 references.) (Author/AEF)

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ED 433 400

Improving Middle School Educators' Computer Application Skills through a Staff Training Program

Susanne Flannelly

A Practicum I Report Presented to the Ed.D. Program in Instructional Technology and Distance Education in Partial Fulfillment of the Requirements for the Degree of Doctor of Education

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by
Susanne Flannelly
Cluster ITDE 1

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Nova Southeastern University
1998

Approval Page

This practicum took place as described.

_____
Verifier: Joseph Quirk
Principal

June 15, 1998

This practicum report was submitted by Susanne Flannelly under the direction of the adviser listed below. It was submitted to the Ed.D Program in Instructional Technology and Distance Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

Approved:

_____
Date of Final Approval
of Report

_____
Thrisha Shiver,Ph.D.,
Adviser

Acknowledgements

This practicum is the result of endless hours of dedication, devotion, and determination that could not have occurred without the assistance and cooperation of many individuals. Therefore, it is here and now that I formally express my gratitude to those who made this a worthwhile endeavor.

First, this practicum could not have taken place without the approval and encouragement of Dr. Peter Bastardo; Superintendent of Schools; Dr. William Setaro, Assistant Superintendent of Schools, Janet Creech, Staff Development Leader, and especially my building principal, Joe Quirk.

Next, I want to acknowledge the assistance of those teachers who volunteered to present and assist during the inservice sessions. These teachers were: Patti Eckstein, Nick Napoleon, Ann Stein, Diane Styczynski, and June Kelly. I would especially like to thank Ann Tarnoff for giving me a helping hand whenever I needed one.

I wish to express my gratitude to the teachers who attended the workshop sessions, for without their participation, this practicum would not have taken place.

In addition, I would like to thank the District Technician, Tom Sanderson, for ensuring that the computers in the lab were in excellent running condition throughout the practicum implementation period.

Finally, I would like to express my gratitude to my family who endured my absence during the past eight months. To my mother, Dorothea Schaible, who understood the importance of my goal, assisted me whenever possible through this journey, and sacrificed our Saturday outings while I was busy writing. To my father, the late William H. Schaible, whose legacy instilled in me the importance of education and whose genes provided me with the tenacity to be a life-long learner. My father-in-law, Francis X. Flannelly, who has always respected my love of learning and to my brothers, nieces, and nephews, who inspired me to work and achieve my goal. It was support from the entire family that assisted me through this work.

And last, but most especially, I thank my husband, Frank Flannelly, for without his love, council, cooperation, understanding, and patience, I could not have completed this practicum. His encouragement was always present. During our 24 years of marriage, he never held me back from anything that I wanted to do. I am truly everything I am because I have his support and love.

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Abstract

Improving Middle School Educators' Computer Application Skills through a Staff Training Program. Flannelly, Susanne E. 1998: Practicum Report, Nova Southeastern University, Ed.D. Program in Instructional Technology and Distance Education. Teacher Training/Computer/ Instructional Technology/Staff Development/Middle School.

This practicum was designed to provide teachers with the skills and confidence needed to use computers in the classroom.

This practicum was created as a series of continuous staff training sessions that would provide teachers with the skills and knowledge necessary to implement the use of computers in the classroom. The 14 workshops and 3 inservice days focused on using the computer for: (a) classroom management skills, (b) evaluating software for instructional use, (c) CD-ROM instruction, and (d) Internet training. All sessions emphasized the development of useful projects that related directly to the educational environment. In addition, workshop attendees were provided with mentors to assist them with the inclusion of computer use in their instruction. Inservice Day sessions were provided by technology savvy teachers who use technology in their classrooms. The writer, a computer teacher and presenter at numerous technology conferences on both the state and national levels, presented workshops.

The results of the practicum revealed that, after completion of the workshop and inservice sessions, teachers possessed the skills and confidence necessary to include computers in their instruction.

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Chapter I: Introduction

Description of Community

This suburban community of 28,000 residents is comprised of middle and upper middle-class professionals with a diminutive diversity of cultures. These professionals commute to surrounding financial centers for employment and the conducting of other business.

Approximately 60% of the community consists of housing developments that were built in the late 1960's to accommodate the needs of city dwellers wanting to experience the suburban lifestyle. The construction of new homes ceased during the late 70's and 80's; however, the community has recently experienced a strong resurgence in the building of new homes. During the past five years, census records indicate an increase of 3,290 residents. This new construction has impacted the school district with an increase of 1,200 students during this period of time.

Approximately 20% of the community is dedicated to business and includes the AT&T Home Office, a Nescafe factory, a community hospital, a large shopping mall, a race track, and an abundance of small independently-owned businesses. The remaining 10% of the community is agrarian in nature and includes acres of farmland dedicated to nurseries and horse farms.

Writer's Work Setting

The work setting is a middle school with a student population of 512 students and a staff of 51 teachers, administrators, and support personnel. The faculty is comprised of a large percentage of veteran teachers who have individually acquired more that 20 years of teaching experience. There are presently five non-tenured teachers working in the school, and two of those teachers were recently hired for a new state-mandated foreign language program.

The Board of Education began to place a heavy emphasis on technology upon the retirement of both the Assistant Superintendent and Superintendent of Schools in 1993 and 1995 respectively. In addition to replacing the top administrators with proactive change agents, the Board of Education assembled a Technology Vision committee in 1996. The committee was charged with developing technology vision and mission statements as well as designing and implementing a multi-year, district-wide technology plan. The committee was made up of administrators, teachers, parents, and other members of the community. The technology plan, including vision and mission statements, was adopted in 1996. Both statements stressed the provision of ongoing training and support of teachers to integrate the use of technology into the teaching process.

Writer's Role

The writer's role is that of computer teacher in the middle school consisting of grades 6-8. The writer's major responsibility is to instruct computer applications courses to students in grades 7 and 8. The writer has been responsible for the design and development of the district's computer curriculum for grades 6-8 since the inclusion of the program in 1982. During this 15-year period, the curriculum has frequently been revised and upgraded to include new advances in the use of technology tools.

The writer has facilitated district-wide summer staff technology training sessions for the past six years. These sessions introduced teachers and administrators to computer operations and emphasized the use of word processing, database, and spreadsheet applications.

The writer also serves as a consultant for purchasing equipment in the district. The experience of working with technology and attending state and national conferences provides the writer with a strong background on the variety of technology equipment that is available as well as its appropriateness for use in a grade K-8 work setting.

In addition, the writer is an active member of the district's technology vision committee which is responsible for implementing a multi-year, district-wide technology plan. As a member of this committee, the writer provides information on staff training to the committee for

consideration and serves as a resource on instructional technology.

Finally, the writer recently volunteered to work on the newly-established School Improvement Team (SIT) for the middle school. Team members for the School Improvement Team (SIT) were chosen by administrators and include administrators, parents, and teachers from the school. This committee: (a) forms building policy, (b) provides input into the building budget, and (c) plays a vital role in the decision-making process.

Chapter II: Study of the Problem

Problem Statement

The problem to be solved is that teachers are not prepared to use computers in the classroom.

Problem Description

Teachers do not have the necessary technology skills or experience to feel adequately confident to integrate the use of computers in the classroom. Consequently, they do not use computers as an aid in class instruction or for assistance in classroom management tasks. The staff did not develop these technology skills because they are mostly 20 year veterans and had not encountered technology courses during their preservice training at the university or college level. A few teachers had taken one computer literacy course during their preservice training, but this course did not provide them with information on how to use the computer in the classroom. In addition, technology staff training sessions provided at the district level was sporadic, inconsistent, and limited in both duration of sessions and access by teachers. Several departments provided training for teachers working in that department only. In 1993, a training program for social studies teachers consisted of eight hours of training in accessing CD-ROM programs and Internet use. In 1994, composition teachers were provided with six hours of training on a word processing program. In

1996, a five-hour session was provided for the training of science teachers in a new computer-based science program. As a result of this void in training, teachers who have computers did not have the confidence and skills needed to utilize the computers in the classroom. In addition, several teachers were computerphobic or reluctant to change. As a direct result of this inadequate training, students are not using computers as a tool in the classroom.

Problem Documentation

There is evidence that supports the existence of this problem. A technology needs assessment questionnaire (see Appendix A) was distributed by the writer to 46 teachers on June 2, 1997, and 40 completed questionnaires were returned on June 9, 1997. The results indicated that, out of 27 teachers who have computers in their classrooms, 12 replied that students were responsible for 100% of the computer use. An analysis of the data indicates that if the students are using computers 100% of the time, then the teachers are not using the computer for classroom instruction and classroom management tasks. This analysis was further supported by additional results from the technology questionnaire indicating that 7 out of 27 teachers used computers for record keeping and test preparation.

The results from the survey also indicated that teachers were interested in learning how to use computers.

Both software evaluation and data base construction were selected by 18 teachers as their high-interest selection. In addition, 16 teachers replied that the selections: (a) desktop publishing, (b) using spreadsheets, (c) software evaluation, and (d) Internet access, were all high interest topics for workshop participation. The questionnaire also indicated that there is a demand for technology training in all areas, with a special interest in Internet training.

Responses to the scheduling of workshops indicated that 20 teachers preferred after school sessions, while 15 teachers preferred sessions to be held during the school day. This indicates teachers' willingness to learn and the need to schedule workshops to accommodate both the after school and during school requests.

Additional evidence of the problem was indicated by the daily usage statistics of the four laptop computers available in the building. The automated library circulation program recorded a total of eight occurrences of teacher usage of the available laptop computers and zero occurrences of teacher usage for computer projection panels for the 1996-1997 school year. If the laptop computers were to be used for classroom instruction, a projection panel would have to be attached to the computer. The panel enables the entire class to view the lesson. Since the projection panels

were not used, the indication is that the laptop computers were not used for classroom instruction.

For additional evidence of this problem, the writer examined the staff's State Personal Improvement Plans (PIP's). These plans are developed by individual teachers to assist them in cultivating and embellishing their teaching skills. Each teacher must discuss his/her intentions with the building principal during a conference before being granted final approval. The records indicated that only 4 out of 46 teachers selected technology to improve their teaching skills.

The final evidence of the problem has been culled from the writer's personal observations. During the entire 1996-1997 school year, computers in two classrooms were covered with plastic bags.

Causative Analysis

There are several theories as to the reasons why educators do not have the necessary technology skills or experience to feel adequately confident to integrate the use of computers in the classroom. The writer has determined that teachers are not aware of the many ways a computer can assist them with their instruction, personal productivity, and classroom management tasks. This became evident after reviewing the content of previous workshops. The sessions focused the instruction on how to use a specific piece of

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software and neglected to explain or model the integration process. Consequently, staff members were not provided with relevant instruction that would meet their individual needs.

In addition, session attendees were not provided with a continual, progressive staff training program. Technology training was confined to several two-day summer workshops. The offering of summer workshops restricted enrollment because many teachers had previously planned summer vacations. Therefore, the infrequency of sessions resulted in the staff's inability to develop confidence in their newly-acquired skills. Without confidence in their own skill development, some teachers feared using computers and believed equipment failure would spoil the continuity of instruction.

Finally, aging computer equipment often caused staff members who were using computers to become discouraged. Equipment was out-of-date, not working properly, or had memory constrictions that prevented the use of new software programs. In some cases, software was no longer available.

Relationship of the Problem to the Literature

The problem of teachers not being prepared to use computers in the classroom is a common issue often reported in literature reviewed by the writer. The issues and concerns found in the review of literature and at the practicum site are similar. Numerous survey results document

the problem of infrequent utilization of computers by teachers (Cuban, 1989). It is reassuring to know that other institutions are also concerned with this situation and are trying to rectify it. By the same token, some findings are more conclusive than others. For example, evidence of the problem is reported in an Office of Technology Assessment (OTA) survey (1988), which stated that one-half of all classroom teachers do not implement computers into their instruction in the classroom. This finding confirms the magnitude of the problem and correlates with the situation at the practicum site where fewer than one-half of the faculty use computers. However, uncertainty exists as to the availability of computers intended for use by teachers. A study sponsored by the Minnesota Educational Computing Corporation (MECC) found that 95% of public schools have computers, but 50% of the teachers never use them (La Frenz & Friedman, 1989). These findings eliminate the doubt of availability since 95% of public schools reported that they have computer access. However, these findings substantiate the problem that teachers are not utilizing computers.

The existing problem is apparent across the curriculum. Becker's (1991) explanation of information obtained from the Supplementary U.S. Teacher Survey on high school level science, math, and English faculties indicated limited use of computers for teaching and learning. As a result, the

evidence indicated that the lack of computer use in schools is not connected to a specific subject content area but affects teachers of all disciplines. Similar problems exist within the content of preservice programs for teachers. Knapp and Glenn (1996) stated that schools of higher education need to consider redesigning their professional development programs in order to prepare teachers for the 21st century. Furthermore, Durost (1994) explained how inadequate training can affect students. If teachers do not use computers in the classroom, then students do not either. If teachers are not willing or able to use technology, then their students will not either. The phenomenon exits. The technology that runs the world on the business scene has only affected less than half of the teachers in the educational community in the United States. These findings support the problem of this practicum, and several have a direct correlation to the practicum site where 7 out of 27 teachers use computers. Teachers who cover the myriad of subject content are not prepared to use computers, and, since they do not use computers in their classrooms, the students are not using them either. The problem requires a careful examination of research to determine the reasons why teachers are not adequately prepared to use computers.

The writer discovered that one widespread reason for teacher inability to use computers was their own resistance

to change. The writer agrees that this is a contributing factor that leads to teachers being inadequately prepared to use computers. Teachers have developed cynical attitudes towards change after being subjected to numerous new teaching approaches, as well as educational promises and gimmicks. Many teachers remember foreign language labs from the late 1970's. The purpose of the labs was to have every child speaking fluent Spanish, French, or German. Other teachers remember the determination to convert to the metric system. These goals have never been realized. Teachers are tired of the revolving door policy and of spending valuable time on passing fancies. As a result, they have developed a resistance to change. This is an underlying cause for the failure of many computer training programs. Many authors have addressed this issue. Several are delineated here. Several studies (Becker, 1991; Evans-Andris, 1991; Kearsley, & Lynch, 1992), conducted on both local and national levels, support this issue and found that some teachers demonstrate an attitude of resistance to using the computer. To identify teacher resistance, Evans-Andris, (1995) recommended looking at teachers who remain with their regular teaching routines and ignore computers. The attitude of a teacher who displays resistance is to stick to what works because it has always worked in the past. This example of resistance can be found in many classrooms across the country. This resistance

attitude or fear of change can be observed at the practicum site. Consequently, several faculty members exemplify Marshall's (1996) findings and believe that technology is just a fad. The writer recognized that this issue is prevalent in many educational institutions. Furthermore, many teachers identify with Marshall (1996) and ignore the use of computers because they do not see how it will directly affect or improve their teaching. This issue, while resistance-based, is also nurtured from the lack of understanding of what a computer can do.

Avoidance is another issue that affects the teachers' ability to work with computers. Teachers in avoidance are one step above the resistant phase mentioned above. These teachers accept the use of computers for students use, but they refuse to work with a computer (Evans-Andris, 1995). Avoidance is nothing new. Thirty years ago, teachers avoided the use of movie and slide projectors but permitted a capable student to operate them in class. The computer exists in the same category.

Another issue is the individual teacher's level of self-confidence with his/her own ability to use computers. A teacher at this level is one step above the teacher in avoidance. The difference is that this teacher would like to use computers in the classroom, but the lesson must be fail safe. Teachers must be confident enough in their own skills

to present lessons to the students. If teachers do not feel confident in using technology in the classroom, they will refuse to use it. Several authors have discussed this issue. Yaghi (1996) found that there is a connection between a teacher's self-confidence and the frequency of computer use. This finding is obvious and correlates with any new venture, not only with computers. Lack of self-confidence leads to an aversion to the task that provides this feeling of uncertainty. Further support of this issue is found in Gilmore's (1995) report from a computer usage survey given to 710 teachers. The results indicated that 60% responded as having either very little or no confidence in using computers. This issue appears at the level of higher education as well. A study taken by National-Louis University (Handler & Pigott 1993) found that first-year teachers are not confident in using computers in the classroom.Research studies also indicated that anxiety is the cause for the limited use of computers. Many teachers demonstrate a fear of computers. This fear, known as computer anxiety or computerphobia, is very common among adults in general. Some fears are based on the assumption that the computer, a machine, might eventually replace the teacher as sole instructor. Other fears focus on the teachers' inability to understand how a computer functions. These teachers do not realize that it is not necessary to

know how the computer functions, just as it is not necessary to understand how a television functions. One learns how to turn on a television and operate the channel controls; that is all is necessary. Once teachers can learn the basic operations needed to run a computer, their computerphobia can be eliminated. In addition, fear includes the terminology associated with computers. Computer jargon and acronyms intimidate new users. Consequently, computer anxiety is an issue that affects many education institutions. The writer agrees that providing a comfortable and relaxed training setting is an important element in any training event and is even more essential with computer training. Several studies found in the review of literature support evidence of computer anxiety. In general, computer anxiety affects up to 30% of the work force and prevents people from using computers (Harrington, McElroy, & Morrow, 1990). Computer anxiety also affects 46% of technical education teachers (Ayersman (1993). Furthermore, in a study assessing teachers' attitudes towards technology (Kluever, Lam, Hoffman, Green, & Swearingen, 1994), computer anxiety was identified as one of the four attitudes expressed by teachers. Therefore, the problem of computer anxiety exists, and the cause needs to be examined with a remedy provided.

Another issue found to be the cause for faculty members not being prepared to use computers is focused on staff

training. After all, staff training is the method institutions use to provide teachers with information on the latest strategies and trends in education. The other methods used to provide staff training are workshops and conferences sponsored by private or professional organizations and at the county, state, and national levels. However, these workshops and conferences are costly and are held during the school day which require the use of professional days and substitute teachers. As a result of budget restrictions, only a handful of teachers can take advantage of this opportunity. On the other hand, an organized staff training program can be used to train an entire district.

As mentioned earlier in this proposal, causes for the staff members at the practicum site not being prepared to use computers also focused on: a) infrequent and sporadic sessions training, b) inconvenient session times, and c) irrelevant instruction that did not meet teachers' needs. These causes resulted in the teachers not only being unprepared, but also discouraged and unwilling to use computers in the classroom.

The issue of infrequent training sessions was reported in the National Survey of Internet Usage (Charp, 1997) which found that an obstacle that faces many classroom teachers today is the need for more training. The writer confirms that sporadic offerings of sessions leads to an unskilled

staff as apparent at the practicum site. Teachers lose what little knowledge in skills they learned without the opportunity to practice skills and acquire new skills as needed. Several studies (Sheingold, Kane & Endreweit, 1989; & Means, 1994) found that teachers want more time to use equipment to further develop their expertise and become comfortable with computers. The writer believes that the issue of additional time could be more instructional time and/or practice time. The problem is particularly evident in schools that do not provide at least one computer for each classroom. At the practicum site, many teachers who attended training sessions could not reinforce the skills learned because they did not have access to a computer. This impacts on the original problem of teachers not being prepared to use computers.

There is a need for institutions of education to develop thorough technology staff training programs that provide teachers with the knowledge and confidence necessary to integrate computer use in the classroom. This issue is supported by Woodrow (1996) who found that teachers' attitudes about computers change significantly after receiving training from a comprehensive staff program. Furthermore, a survey of 34 elementary teachers who had taken part in an extensive training program (Davidson & Ritchie 1994) found that 91% rated their experiences as

good, and 9% rated them as poor. The problem is further supported by the results of Fullan's 1992 study indicating that 62% of teachers who took part in a time-extensive staff development project were able to apply technology in their own classrooms. This concern is not limited to the United States, as Juliff (1995) reported concerns at the International Federation for Information Processing (IFIP) regarding the limited technology training of educators in Europe, Africa, the Middle East, and the Asia Pacific region.

Irrelevant instruction that does not meet teachers' needs is another issue of concern found at the practicum site and in the literature review. Teachers do not want to see examples of spreadsheets that show how a mortgage rate is depreciated over a 30-year period, but are interested in how a spreadsheet can be used in a social studies or science classroom. Most computer technology is being used for isolated activities unrelated to a central instructional theme or concept (Moersch, 1995). In a study to determine the barriers that affect computer integration, Hadley and Sheingold (1993) concluded that computers are not being integrated into core learning activities. Consequently, the training was not effective because the trainees could not relate to it. Furthermore, many training sessions focus on equipment operations and not on the

integration of technology into the curriculum (Feil, 1996). This is the reason why previous training attempts have not been successful. By learning how to operate the computer, the teacher's attention was focused on the machine's mechanics. Instruction did not provide the opportunity for teachers to make the connection of how to use the computer as a tool in the classroom. They are interested in finding out how they can integrate computer use into their classrooms with examples of what can be done and explanations of how to do it. Marshall (1996) found that education programs seem slow to incorporate good models of technology practice into the classroom. Furthermore, a case study illustrating teacher development (Persky, 1990) cited results that teachers are struggling without school-based support and sufficient training. In addition, Means, Olson and Singh (1995) found that teachers need the opportunity to learn from exemplary users of technology and need time built into scheduling for this to occur.

Staff training plays a vital role when attempting to resolve the problems previously cited in this paper. The review of literature revealed that many institutions have invested time and money into an attempt to provide training sessions for their faculties. However, the training has not been successful as is apparent at the practicum site. There is a body of evidence that substantiates the correlation of

inadequate teacher training and the lack of computer use (McCarthy, 1993). Evidence to support this problem is in The Wirthlin Group Report (1989) that found 59% of all U.S. teachers believe they are not adequately trained to use computers in the classroom. Hadley and Sheingold, (1993) indicated that inadequate training directly affects the integration of computer use into the curriculum.

The problem is also apparent at the university level. Cuban (1994) stated that most preservice programs for new teachers only include a brief introduction to technology. These teachers are not being provided with the technology skills needed to use technology in classroom. Thus, the integration of computers is a slow process and is a direct result caused by the inadequacies of preservice and inservice teacher training attempts (D'Ignazio, 1992).

The realization of the necessity to include technology instruction at the university level was the motivation for the New Jersey State Technology Plan, (Stapleton, 1992). The plan has identified goals for the preparation of educators that include the infusion of technology into classroom instruction, and the content and continuity of program designs are emphasized. In addition, the inclusion of technology proficiency elements was utilized to design teacher education courses (Rodriquez 1996). The writer found, through a review of research, that many professionals have

written about similar problems which appear globally at the elementary, secondary, and preservice levels of teacher training. Consequently, the problem at the practicum site is a common one. One of the main issues connected to this problem is computerphobia or overcoming the fear and anxiety derived from learning how to use computers. This can also lead to a lack of confidence. Another issue is the scarcity of continuous, comprehensive staff training programs that integrate technology with curriculum through the inclusion of projects. The studies cited above relate to those issues which validate and support the problem addressed in this practicum proposal.

Chapter III: Anticipated Outcomes and Evaluation Instruments

Goals and Expectations

The writer has developed the goals and expectations to address this problem. The number of teachers presently using computers as a classroom tool will increase in the areas of instructional delivery and classroom management tasks. Furthermore, it was expected that as the teachers increase their use of computers, the students' use of computers will increase.

Expected Outcomes

The following outcomes were projected for this practicum:

1. All available computers will be utilized at least one period during the day.

2. As a result of this practicum, 10 out of 12 teachers will be able to use the computer for classroom management.

3. All teachers who attend the staff inservice will learn to evaluate software.

4. There will be an increase from 4 to 12 teachers who will include technology infusion as their topics for the State Personal Improvement Plan (PIP)

5. Out of 27 teachers who have computers in their classrooms, at least 12 will use computers twice a week for classroom instruction.

6. There will be an increase in teacher Internet access usage from 3 teachers to at least 30 teachers during the implementation period.

Measurement of Outcomes

The expected outcomes were measured by various methods. First, an account of how often computers were used was maintained by a software monitoring program. The shareware program, Peeping Tom (1994) by Olmsted, provided a tangible log of the frequency and duration of use for each classroom computer and was selected for that reason.

Second, a checklist of performance skills was used to measure the number of teachers able to successfully complete computer management tasks (see Appendix B). The checklist was completed by each workshop participant and signed by the workshop instructor. A performance checklist was selected to provide the writer with a record of how many teachers acquired the skills needed to perform classroom management tasks.

In addition, a review of teacher portfolios with samples of classroom management work was gathered. Each teacher who attended the workshop was required to keep a portfolio of work completed during the sessions and any computer work that

was produced after attending sessions. All work was dated. The writer reviewed each portfolio and maintained a record of individual progress. The results provided tangible evidence of an increase in the number of teachers using the computer for classroom management tasks.

Next, teachers can evaluate software as measured by their successful completion of a software evaluation form (see Appendix C). This evaluation tool provided the writer with evidence of the teachers' ability to evaluate software and the evaluation forms were used for that reason.

In addition, a tally of the total of State Personal Improvement Plans (PIP's) that mentioned technology infusion was recorded. The use of state mandated plan was selected by the writer because it provided a documented commitment from the teachers with their intentions to expand their technology skills and implement technology in the classroom.

Next, circulation statistics, collected through the Winnebago computerized circulation management system, compiled dates and usage of laptop computers and projection panels. The frequency of their use was the element measured over the implementation period. The writer selected this evaluation tool to validate the desired outcome laptop computers being used at least twice weekly.

Finally, a written log of class sign-up requests was to determine the increase in Internet use. Library procedure

required teachers to reserve Internet access time in advance. Reservations were recorded on a chart and logged. This log indicated a tangible increase of Internet usage during the implementation period. For this reason the writer selected to use the sign-up request as an evaluation tool.

Chapter IV: Solution Strategy

Discussion and Evaluation of Solutions

A comprehensive review of literature has resulted in the finding of possible solution strategies based on similar problems in other institutions. Some of these are: a) the inclusion of useful projects, b) the use of laptop computers, c) the construction of a comprehensive, continuous staff training program, d) providing homogeneous grouping, e) providing a mentor, and f) demonstrating the connection of technology utilization with curriculum.

The first possible solution found in the review of literature is creating a useful project. Training sessions that provide teachers with ideas on how to use computers in the classroom are exactly what teachers need to be able to replicate and integrate computer use in the classroom. Many teachers understand how a computer is used in the field of business for finance, correspondence, and record keeping. However, many teachers do not realize how the computer could be used as a tool in the classroom. They have no idea how this tool can enhance their teaching and assist them in the organization of classroom management tasks. Consequently, designing a training session that provides each teacher with the knowledge of how to create a project enables teachers to have this experience first-hand. Not only does it provide teachers with knowledge it also gives them the confidence in

using the computer. According to Boe (1989), a project activity such as making a poster or writing a permission slip is an effective incentive to get teachers to take the first step in using the computer. This strategy also helps to win over the teachers who have been avoiding the use of computers, as they now realize how a computer can be used in the classroom. Once teachers know they can succeed at one level, they are curious to find out what other work tasks a computer can accomplish. In addition, Dickey (1994) presented a clinical workshop for early elementary teachers that focused on the use of technology to accomplish classroom management tasks. He believes that successful training programs need to match technology experiences with the needs of the teachers. At Rowan College of New Jersey, Faison (1994) designed teacher preparation courses that included hands-on training to create and produce instructional classroom materials. As a result of this instructional approach, all 23 participants reported using computer-related technologies on a regular basis. In further support of this strategy, Morrison (1996) described Project SMART, a three-year teacher training project funded by the U.S. Department of Education, that has successfully instructed teachers to use the computer as a tool for solving problems through the design of student projects

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The studies cited above convinced the writer that inservice training must have a direct connection to the curriculum content and must provide examples that would enable the teachers to see how the computer can be integrated with instruction.

Research studies also point to the use of laptop computers as a strategy for providing teachers with portable equipment that can be used in the comfort of their own homes as well as in the classroom. Laptop computers can be a valuable asset to a training program. Since a laptop is portable and battery-operated, teachers can work virtually anywhere with the laptop. At a time of overcrowded schools in which teachers are losing access to their classrooms during their preparation time, a laptop provides the versatility of moving with the teacher. Whether it is down to the library or the faculty room, the laptop is ready to go. Teachers can work on reinforcing their own skills anytime and anywhere. Another benefit for a teacher in a science class is that the computer can go on a field trip outside the room to record data. In support of laptop computers, Level, Peterson, Hall, and Caverty (1994) delineated success achieved from using a laptop computer with a display unit in the classroom to provide 100 preservice teachers with hands-on experience. Follow-up survey reports showed a significant increase in the number of ideas preservice teachers could generate using a

portable computer. In addition, Stager (1995) noted the success of the in-classroom model for staff training in a Australian school that provided each teacher with a laptop computer and trainer support in his/her classroom. Teachers' assessments of this program have been extremely positive.

The advantages of laptop computers are cited above. Moreover, the disadvantage of laptop computers is the initial cost and maintenance expenses. Laptop computers provide flexibility; however, they are costly. The price of an average basic laptop starts at $2000.00. Many school districts would rather use that same sum of money towards a complete computer system, printer, and software. In addition, replacement batteries cost on an average of $100.00, and, if a screen cracked or damaged, the replacement charge is $500.00. With this is mind, the writer still believes that it would be an advantage to have at least two laptop computers available for teachers as part of the training experience.

The use of mentors to assist teachers in the implementation and use of computers in the classroom is another solution strategy found in research studies. Mentors can be used as a follow-up feature after a teacher completes a training session. Mentors can assist teachers in feeling confident using their newly-acquired skills by providing support, suggestions, and encouragement. Teachers who receive encouragement and support with any new teaching strategy will

more readily support it. This is also true with the use of computers. Knapp and Glenn (1996) stressed mentoring as a key element of a successful staff training program; the one-on-one assistance fosters the learning of new skills. Mentoring has been successfully used in the district's staff development program for Madeline Hunter's Essential Elements of Instruction. Since this experience, the staff is familiar with the concept of mentoring and would readily accept its inclusion in this program.

The solution to the problem of teachers not using computers in the classroom is focused on improving staff training programs. To select the solution strategies for staff training, it is necessary to find out what elements should be included in a successful staff training program. Various successful attempts were reported in research studies. The writer found particular interest in some of the strategies used in the following programs. Providing homogeneous grouping for learners was recommended by Carrier, Glenn, and Sales (1985). Their two-level program for training teachers consists of beginners' and advanced programs. As a result, program participants reported that they learned at a comfortable rate of instruction and successfully advanced through the program.

Homogeneous grouping has definite advantages to both the trainer and the trainee. The trainer has previously

identified the performance skills of the trainees. This permits the trainer to tailor the program to spiral upward towards the advanced levels. Furthermore, the trainees in the beginners' group will not be intimidated by the workshop attendees who are more advanced than they are. In addition, the advanced trainees will not be slowed down by the questions from the beginners' group and will progress swiftly to learning new skills. Homogeneous grouping could benefit all the stakeholders involved with the training sessions and should be considered. However, an evaluation tool must be devised by the trainer to identify the trainees' acquired performance skills. The accuracy of developing homogeneous grouping of the workshop attendees will depend on the accurate design of the evaluation tool.

Another training program was identified by Carrier and Lambrecht (1984) in which eight major competencies were delineated to prepare teachers for using computers in instruction at the University of Minnesota: (a) knowledge of basic computer skills, (b) educational and personal uses of computers, (c) evaluation of software, (d) computer-assisted learning, (e) educational and societal implications of the information age, (f) the ability to use authoring programs, (g) knowledge of projects and materials related to education, and (h) the ability to develop and manage a computer environment. All of these competencies are important to the

training of future teachers. Every computer training program should include the basic foundation in computer skills. As most teachers are responsible for ordering software, it is also important for a teacher to understand how to evaluate software. In addition, the use of authoring software is a vital skill for teachers' that want to create their own presentations using the computer. The writer believes that this essential technology foundation provides teachers' with the ability to develop and manage computer environment. Whether the teacher needs to know how to use one computer with 25 students or needs to manage a networked environment, this training is beneficial.

Another staff development plan, presented by Spriggs and Bohannon (1995) from Lee County, Florida, consisted of four levels of involvement: (a) awareness, (b) knowledge, (c) skill development, and (d) application. The plan is now one year ahead of schedule and has already reported a successful training experience for teachers. This plan simplifies the categories of computer training and helps both the trainee and the trainer understand the task at hand. Through awareness, one understands and learns new skills that can be applied through the use of software.

In addition, Erp and Golden (1994) delineated the Marietta College Model, an approach to teacher education which includes the use of hypermedia to create units and

lessons. Students commented positively on interactively working with hypermedia unit plans. This program provides students with learning the technology skills of today to provide projects that they will need to create as future teachers. The use of hypermedia provides teachers with a presentation tool that includes: a) text, b) graphics, c) sound, d) animation, and e) video. Using hypermedia for presentation tool development provides the teacher with a device that will motivate students and hold their attention.

The use of a comprehensive approach to create an independent academy for teacher training is explained by Miller (1996). The program offerings included keyboarding, word processing, database management, and presentation development. The staff response to this program was enthusiastic, with 83 of 90 staff members participating in the program. The idea of establishing a comprehensive program that is site-based focuses on of the essential concerns of a good technology staff training program. In addition, the topics for inclusion in the program cover the performance skills that teachers need.

Uebbing (1995) discussed the design and successful use of a complete work package in a K-12 staff training program in Canandaigua City, New York, that permitted trainees to work independently. The package included user-friendly software for lesson planning, test and quiz construction,

gradebook, word processing, and spreadsheet analysis. The main advantage of this program is the design of sessions that permits the trainees to work independently. The lock-step method used in many computer training programs does not work. Trainees get confused or make mistakes and either lose interest in the work or ask for assistance while the entire class is waiting until the assistance is concluded. In this program, the lock-step method would be eliminated because all participants work at their own rates. This feature should be included in training programs as it would provide an advantage to all the stakeholders.

The last program to be considered by the writer was a teacher inservice program. Espinosa and Chen (1996) described using the World Wide Web, the constructivist approach, and included a self-reflection journal that recorded the frequency and duration of computer log-ons to be kept by each teacher. Findings of this study found that teachers gained experience and increased their use of computers both for their own professional development and for curriculum enhancement. Instruction using the World Wide Web is needed at the practicum site. The success noted by this program merits the use of some elements to be integrated into the program used at the practicum site. Elements of: a) homogeneous grouping, b) inclusion of major competencies, c) comprehensive program design, d) the World Wide Web, e.)

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hypermedia, and f) the use of independent activities from the sources cited above can be synthesized into a series of comprehensive workshop training sessions appropriately designed for use at this practicum site.

Description of Selected Solutions

The writer prepared to try several solutions to rectify this problem. The task was to design a series of sequential workshops based on the results of the needs assessment questionnaire and several solutions cited above.

To avoid the limitations of the district's past policy in offering summer workshop training, the writer planned to provide both inservice days and workshops that included a variety of days and time frames to accommodate teacher schedules based on information received from the needs assessment questionnaire. Furthermore, using information gleaned from the study by Uebbing (1995), the workshop material was user-friendly and designed to allow trainees to work independently. In addition, based on the study of Carrier, Glenn and Sales (1985), separate workshops were structured for teachers who were designated as beginners or advanced users of computers. A combination of the studies by Boe (1989), Erp and Golden, (1994), and Espinosa and Chen, (1996), lead the writer to design sessions that also utilized hypermedia and the World Wide Web to create useful projects.

Consequently, teachers learned the value of these technology tools and how they can be used to meet curriculum needs.

Just as Knapp and Glenn (1996) suggested, the writer established a mentor program to assist and encourage teachers to implement the use of computers into lessons. In addition, the writer established a team of computer club members who assisted teachers by providing technical support for the immediate solution to equipment problems in the classroom.

As suggested by Stager (1995), Murphy and Miller (1996), the use of incentives can help to motivate teachers to use technology. The writer provided substitute coverage during homeroom for those teachers who designed and implemented lesson plans requiring computer use.

The successful implementation of laptop computers was suggested by Stager (1995), Leavell, Peterson, Hall, and Caverty (1994). Since the school has three laptop computers that are available to teachers through the library, the writer publicized their availability. This was accomplished through written notices and daily announcements during the first month of implementation.

Report of Action

During the implementation period the writer had the opportunity to assume a leadership role similar to that of a technology specialist, emphasizing various managerial skills

such as the planning, designing, and continual delivery of staff technology workshops and inservice training.

Using a strategy gleaned from research, the writer implemented the process for the technology staff training component of this practicum which occurred in two forms: inservice days and after school workshops. The sessions included training in: (a) classroom management tasks, (b) software evaluation, (c) CD-ROM use, (d) hypermedia presentation programs, and (e) Internet training. The main focus of the training sessions was to ensure that teachers who attended the workshops would be able to use their computer skills to perform classroom management tasks and create useful projects that would be used with their classes. An essential mentoring program was added to assist teachers with the technology implementation process as training sessions continued to occur.

The writer followed these steps in the implementation process. Four months prior to implementation, the writer discussed the practicum plans with the building principal. Since the district policy is to plan inservice day topics in advance, the writer wanted discuss the practicum with the principal and to designate, well in advance, that these inservice days were dedicated to technology training. The principal agreed and also included technology staff training as the building objective for school year. This provided the

writer with three inservice days during the implementation period to hold technology inservice for the entire staff. These sessions were delivered on a weekly basis to give continuity to the training process.

In addition, to enlarge the software collection, it was necessary to procure funding prior to the implementation period. The writer requested and received $1000.00 from the Parent Teachers' Organization (PTO) to purchase the software that was needed.

Lab preparations were made each week prior to the workshop date. Installation of software and special peripheral devices was also completed in advance of the session. Prior to each session, the writer notified the registered attendees, duplicated hand-outs, and confirmed workshop presenters.

During the first month of implementation, the writer selected the inservice and workshop topics. In addition, the writer selected: a) workshop instructors, b) filed building-use forms, and c) prepared advertisements for the training sessions. The implementation program began with an inservice day. The writer selected a teacher who had experience in using a gradebook program to present the session, "Using an Electronic Gradebook Program." The district's staff development leader requested that a session on troubleshooting computer problems be included in the workshop

and recommended a teacher from another school in the district who had had experience in this area.

During the second week of month one, final scheduling arrangements for the sessions were made, and each teacher received a schedule of the assigned sessions for the day. The first inservice was held later that week. Forty-five teachers rotated through two 90-minute training sessions. The gradebook workshop was held in the computer lab. Teachers were provided with a demonstration of the program and then given hands-on time to experiment with the program on their own. Teachers who were interested in using this program were provided with an authorized copy of the program. The trainer volunteered to assist 8 teachers with the installation and set-up of the program on their classroom computers. The trainer was also available for consultation with the teachers and answered any questions the teachers had concerning the programs use.

The coinciding workshop on trouble-shooting computer problems provided the attendees with a demonstration of technical problems that might occur. A matrix of common problems and instant remedies was provided for each attendee during the inservice. Suggestions for the prevention of hardware and software problems were also provided.

In addition, the writer procured a wide variety of software programs from the media specialist and staff development leader for the next scheduled inservice day.

During the third week of the implementation phase, the writer prepared a synopsis of the 14 proposed workshops. Then, all teachers received notices inviting their participation in the sessions. The notice requested that replies be returned within one week. All forms were returned, and a database of participating teachers was created to keep accurate records and to share this information with the District Staff Development Leader at a later date.

In addition, the writer announced the formation of the Technology Support Team composed of Computer Club students who had been trained in this area. The purpose of this team was to provide immediate technical support to teachers who requested it. Otherwise, the district policy is to fill out a form and notify the district technician. This method can take several days to resolve the technical problem.

The writer designed the second inservice, Software Evaluation, during the second month of implementation. The writer also prepared the computers for the inservice by installing two separate programs on each of the twenty computers in the lab. Two computers were designated for each subject area taught in the school. The programs were selected on the basis of information covered in the seventh and eighth

grade curricula. Each computer was labeled with the title of the subject content and the name of the program to be evaluated. Later that week, the writer presented three one-hour sessions during the inservice day. Teachers previewed the software collection and were asked to examine one program for inclusion in their classroom and to complete a software evaluation form (see Appendix C). Copies of software reviews and a list of journals that provide software reviews were disseminated to each attendee.

During the following week, the writer designed the first workshop session, "Making Classroom Management Tasks Painless I," to be the first in a series of sequential workshops based on the results of the needs assessment questionnaire and solution strategies previously discussed in this report. These workshops focused on creating items that teachers could actually use to lighten their workload. The writer prepared hand-outs in an easy-to-follow tutorial format of instructions so teachers could work at their own pace. The tutorial format was gleaned from Uebbing (1995) who noted that lock-step method was not an effective approach, and that teachers work best at their own rate. The next week, teachers were encouraged to use computers. The media specialist designed flyers announcing the availability of three laptop computers in the media center that teachers could borrow.

These notices were placed in all teachers' mailboxes and posted in the faculty room lounge.

During the seventh week, the first workshop, "Making Classroom Management Tasks Painless I," was held. The workshop sessions consisted of two days with 90-minute sessions per day that were held after school. Each session focused on using a word processing program or a database program to manage student information such as: a.) class lists, b) textbook numbers, and c) permission slips. As a result, teachers who attended this session created homeroom lists that provided students' locker numbers, combinations, and blank areas for returning notices, report cards, etc. The teachers created useful instruments that assisted them in the organization of their record-keeping tasks. A portfolio was created for each workshop participant, and samples of each person's work was put on file. Also, each participant completed an evaluation form (see Appendix D).

In addition, during this session, the mentoring element was introduced. Each teacher who participated in the workshop programs was provided with a mentor. The mentor provided assistance and recommendations for the methods through which computers can be used with instruction. The mentor has personally observed teachers who volunteered to implement computer usage into class instruction and provided feedback to those teachers regarding their performance.

During the next week, the writer installed a computer-monitoring program on 18 computers in the media center, science lab, and English rooms. This software provided an accurate record of the length of time a computer was used and which programs were accessed. In addition, the writer reviewed the evaluation forms from the previous session, looking for remarks that could assist in improvement of the instruction. Recommendations were included in the next workshop.

At the beginning of the third month of the implementation phase, the workshop preparation and sessions continued. During the first week, Workshop 2, "Making Classroom Management Tasks Painless II," was designed to follow the scope and sequence of part I. In this session, the Claris Works word processing program was used by the teachers to create templates for their substitute plans, seating charts, certificates, and business cards. Workshop attendees followed tutorial style guides to create the templates.

The workshop was held during the following week; teachers left the session with emergency plans and seating charts in their hands. Several teachers who had attended conferences were interested in creating business cards and later left with their creations. The teachers received evaluation forms (see Appendix D) and stated that they liked the ability to work on their own.

Also during that week, the writer designed the third and last sessions in the Classroom Management series. Workshop 3, "Making Classroom Management Tasks Painless III," involved the creation of a calendar for the month and the marking of dates to remember. The session also introduced the use of spreadsheets to calculate grades or to create labels for a mailing list. A notice was sent out that requested that each teacher bring a list of students' names and addresses to this session. The list was used to create a database for preparing mailing labels. This project demonstrated the importance of a computer in making routine correspondence tasks easier.

Workshop 3 was held during the following week. Teachers created products that they could immediately utilize in their classrooms. All teachers brought their information to create mailing lists, and mailing labels were printed out during the session.

During the tenth week, the writer installed a computer-monitoring program on ten computers in the home economics room, sixth grade classrooms, and social studies classrooms. As discussed earlier in the paper, this software assisted in providing information on how frequently computers were being used.

In addition, the writer developed a technical troubleshooting program that trained students to work on the Computer Club's Technical Support Teams. After students

completed six forty-five minute sessions that took place on a weekly basis after school, the students were tested on their ability to find and correct simple technical problems. The test consisted of a hands-on experience in which 10 computers in the lab were deliberately set up with a particular technical problem that the student had to correct. Problems consisted of: a) loose cables, b) errors in the control panel settings, c) printer jams, d) adjusting RAM memory, e) using the system disk first aid disk, and f) checking the chooser selection for the printer. All club members who passed the test with a score of 85 or higher were certified to assist teachers experiencing technical problems.

The school was closed during the twelfth week of the implementation phase. The writer reviewed the evaluation forms and updated the database to include a list of those teachers who had participated in the workshops previously given. The writer also prepared a list of CD-ROM titles that workshop participants could preview during a future session.

The fourth month of the implementation phase continued with workshop design and the presentation of sessions and also included data collection and mentoring. During the first week, computer usage records were compiled from the computer-monitoring program installed on the classroom computers. Information was recorded on a database to provide ease of

interpretation of this information at the end of the implementation process.

During the next week, the writer met in a mentor capacity with all workshop attendees and provided suggestions for the implementation of computer-use for the classroom to complete classroom tasks. Teachers shared room organization sheets that had been created to inform students of the storage location for supplies and equipment stored in the science lab and home economics room.

The following week, the fourth workshop, "CD-ROM use in the Classroom," was held during two ninety-minute sessions. Teachers determined how a CD-ROM could be used in the classroom and designed a lesson around its use. The use of LCD panels and projection devices was also demonstrated during this instruction time. Through this demonstration, teachers realized how one computer could be used effectively to aid in classroom instruction. Consequently, even with the procurement of a wide variety of CD-ROM software, several teachers could not find software that would meet their curriculum needs. During the session, the writer suggested that the teachers design their own programs using a hypermedia authoring program. It was explained that this project would require the teachers to work additional days after school and during their prep time. However, several teachers wanted to work on this project. The writer continued

to mentor the teachers throughout the development process of their own programs.

To prepare for the Internet inservice, the writer asked three teachers, experienced in using technology, to assist the inservice instructor at the Internet inservice and arranged for the district technician to be on-call to handle any technical difficulties that might occur. The assistants were included in this workshop to aid teachers who experienced problems during the session. The technician agreed to attend the inservice to provide immediate solutions if a problem with the equipment occurred.

During the fourth week of month 4, the writer created a web page (http://www.fcae.nova.edu/~flannell.Sue.html) that was used for the Internet workshops and consisted of educational web sites that included a variety of disciplines. The web page was designed to provide teachers with easy access to lesson plans, activities, and general curriculum information. Thorough the web site, teachers were able to access the web page, use the Netscape Tutorial, and preview web sites on all subject areas. In addition, a handout was designed that provided additional website information. All this information was reviewed during a meeting between the writer and the inservice instructor.

In preparation for the Internet inservice, the writer notified the staff leader to send notices to the teachers

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announcing the inservice date and the time of their sessions. In addition, reminder notices were sent to the staff to remind them of the future dates of the Internet workshops. At this time, teachers were given a second chance to register for the sessions.

At the beginning of the fifth month, the writer announced the expansion of the Technology Mentoring Program during a faculty meeting. This program utilized the teachers who had previous technology training to train and assist others in learning how to use the computer. Teachers were asked to sign up for the program if they were interested in being a mentor or mentee.

During the following week, The Internet inservice was held. A total of 44 teachers attended. Teachers were instructed to access the Netscape Tutorial from the web page for a hands-on learning experience. Next, by accessing the web page that had been developed by the writer, teachers were connected to web sites on a variety of curriculum topics. Evaluation forms were completed by each teacher who attended the session and were reviewed by the presenter. To prepare for future Internet workshops, the writer sent the district technician a list of teachers who had signed up for the Internet workshops requesting e-mail accounts for them.

Also, in the third week of the fifth month of implementation, the last in series of training workshops was

designed. These sessions were based on the Internet and World Wide Web-based training and included six 90 minute sessions. Session one, "Surfing the Net I," included Internet basics and search engines and provided each attendee with an e-mail account. The workshop consisted of two ninety minute sessions that were held on consecutive days in the computer lab. Day One of the workshop introduced the basics of the Internet which included the anatomy of a web browser as well as sending and receiving e-mail. The session held on Day Two concentrated on utilizing search engines, and the various techniques of narrowing a search were explained. The next week, Session Three, "Surfing the Net II," was held. A total of 20 teachers attended the continuation of the Internet training workshops. During the session, teachers worked with eight different search engines and concentrated on developing effective search techniques to limit a search.

At the beginning of the sixth month of implementation, the next web-based instruction session, "Internet Use for All," was designed by the writer. It provided Internet access in all classrooms through the use of software that permits the user to capture and save a web site. Since web sites are large, a zip drive is used as the saving device. During the first week, the writer acquired additional zip drives that were available in the district and installed them on computers in the instructional lab.

Also during this week, the Technology Mentor Program was activated. The purpose of the program was to develop a group of mentors available to assist other teachers in the implementation of computers into lessons and the performance of classroom tasks. A total of nine teachers volunteered for the program. Five served as mentors and four as mentees. The mentors exchanged ideas and decided that teachers needed to see lessons with technology imbedded into the instruction. They recommended that the staff should be invited to observe classes where teachers were presently using computers. The writer decided to implement his suggestion into the practicum.

During the second week of sixth month, the server in the computer lab malfunctioned, and Internet access was unavailable. The district technician notified the writer that the server would take several days to repair. As a result, the writer sent cancellation notices to the workshop attendees.

The next week, a notice announcing the rescheduling of the Internet workshop was sent to the staff. The workshop was held during the latter part of that week. At this time, two teachers had completed their own programs using a hypermedia authoring program and had delivered the lesson to their classes. The writer observed the lessons and provided feedback to the teachers. An incentive program was devised

for teachers who implemented lessons with computers in the classroom; the writer provided homeroom coverage for those participants.

In addition, notices were sent out to the staff announcing the availability of video and audiotapes on computer instruction that were accessible through the school library. These tutorial instruction tapes provided permitted teachers to reinforce skills learned in the workshops in the privacy of their own homes. In addition, the tapes provided training for staff members who could not attend the session.

During the seventh month of the implementation process, the last in the series of workshop training session based on the Internet was designed. In addition, the writer attended a technology conference and found information on website locations for WebQuests. WebQuests (Dodge, 1997) are similar to lesson plans but are placed on a web page where students can access them to find solutions to problems. The writer based this last workshop on this newly-acquired information and added these sites to the workshop web page (http://www.fcae.nova.edu/~flannell.Sue .html). At this time, the writer realized the popularity of the Internet workshop and decided to reach out to other teachers by providing each teacher with a district e-mail account. The use of e-mail provided teachers with an incentive to learn about the computer. It also provided the teacher a timely response with

correspondence. To provide for these e-mail accounts, the writer sent a request for additional accounts to the district technician.

The Internet workshop on WebQuests was held the following week. The workshop attendees previewed WebQuests to find any that might correlate with their curriculum. Four teachers found sights that they could use with their classes. These sights were captured or harvested using Webwhacker software and a zip drive. The teachers brought the websites to their non-modem classrooms and were able to have the students access the information.

During the third week of the seventh month, the e-mail accounts were authorized by the district technician, and the writer devised a schedule for e-mail instruction of teachers on a one-to-one basis. Instruction time was scheduled before school, during teacher prep times, and after school. The process of one-on-one e-mail training during the next two weeks. This personal training provided a comfortable learning environment for the staff members.

During the eighth month, the mentoring process continued, and three teachers utilized the zip drive in their classrooms to access harvested websites. As per the earlier suggestion from the mentors, the staff was invited to observe this classroom use of computers. The writer assisted teachers with the equipment in preparation for the lessons and

observed these lessons which were held during first two weeks of the month. In addition, the Computer Club Technical Support Team reported their assistance calls. During the five months in operation, the students provided assistance and corrected 30 technical problems.

During the third week of the eighth month, the writer observed another teacher who had implemented computer-use in a lesson and continued to provide teachers with one-to-one instruction based on e-mail access. At this time, 37 out of 45 teachers have activated their e-mail accounts.

The following week, all computers that had been loaded with the computer monitoring software were accessed to print out results of computer use. These results were recorded in a database. A printout request was sent to the media specialist for a record of laptop sign-outs. In addition, the writer and the building principal reviewed the staff's Personal Improvement Plans (PIPS) that included use of technology or additional technology training.

During the beginning of the ninth month of implementation, the writer reviewed all evaluation sheets and computer use printouts. The results were added to the database for analysis. At this time, letters of participation were sent to all workshop attendees with a copy given to the building principal to be placed in each teacher's personal file. A report was sent to the staff development leader and

the superintendent of schools that listed the teachers who had volunteered to participate in the workshops.

Chapter V

Results, Discussion, and Recommendations

The problem resolved in this practicum is that teachers are not prepared to use computers in the classroom. The writer utilized the following solution strategies tc address this problem: a) the inclusion of useful projects, b) the use of laptop computers, c) the construction of a comprehensive, continuous staff training program, d) the provision of homogeneous grouping in staff training sessions, e) the inclusion of mentors, and f) the connection of technology utilization with curriculum.

The writer also developed the goals and expectations to address this problem. The number of teachers presently using computers as a classroom tool would increase in the areas of instructional delivery and classroom management tasks. Furthermore, it was expected that as the teachers increase their use of computers, the students use of computers would increase.

An account of how often computers were used was maintained by a computer monitoring program, Peeping Tom (1994) by Olmsted The shareware program provided a tangible log of the frequency and duration of use for each classroom computer. A record from each computer was compiled twice during the implementation phase in the fourth and eighth

months. The results of these records showed that 25 out of 27 computers were used for at least one period daily and by the eighth month all computers were being utilized (Table 1).

Table 1

Results of Computer Use From Computer Monitoring Program (June, 1998)

Computers (n=27)	Average Daily Use Month 4	Average Daily Use Month 8
Class 1 (7computers)	3 periods daily	5 periods daily
Class 2 (3computers)	<1 period daily	3 periods daily
Class 3 (3 computers)	< 1 period daily	4 periods daily
Class 4 (3 computers)	< 1 period	1 period daily
Class 5 (1 computer)	Not in use	1 period daily
Class 6 (1 computer)	1 period	3 periods daily
Class 7 (3 computers)	< 1 period daily	3 periods daily
Class 8 (1 computer)	Not in use	1 period daily

Class 9 (1 computer)	Not in use	1 period daily
Class 10 (1 computer)	Not in use	< one period daily
Class 11 (1computer)	< 1 period daily	1 period daily
Class 12 (1computer)	Not in use	< one period daily
Class 13 (1computer)	< 1 period daily	1 period daily

Note one period equals 45 minutes.

Outcome 2 stated that as a result of this practicum, 10 out of 12 teachers will be able to use the computer for classroom management.

This outcome was not met.

The actual outcome was that 8 of 8 teachers were able to use the computer for classroom management. This was confirmed through the teachers' performance of classroom management tasks and was verified by a performance skill checklist (see Appendix B) signed by the workshop instructor. This was also substantiated by the portfolio collection of each of the 8 teachers who attended the classroom management sessions. The portfolios contained a variety of classroom management tasks,

tests, and projects. In addition, all participants continuously used the computer in this capacity during the implementation period which was evident by items in their portfolios.

Outcome 3 stated that all teachers who attend the staff inservice will learn to evaluate software.

This outcome was met.

As a result of a staff inservice day, all teachers who attended can now evaluate software. This outcome was assured by the successful completion of 45 software evaluation forms completed by each teacher during the inservice (see Appendix C).

Outcome 4 stated that there will be an increase from 4 to 12 teachers who will include technology infusion as their topic for the State Personal Improvement Plan (PIP).

This outcome was met.

After reviewing 45 Personal Improvement Plans with the principal, results were that 35 teachers chose to devise plans that would include technology (see Table 2). This indicated a substantial increase from the previous year.

Table 2

Comparison of Staff Personal Improvement Plans that Included Technology 1997 and 1998

(June, 1998)

Topic of Personal Improvement Plan (n=45)	1997	1998
1. Utilize Internet for research and instruction	1	20
2. Learn software programs	2	5
3. Use computer with classroom management tasks	1	2
4. Other forms of technology: graphic calculators and computer-assisted drawing (CAD) tools	1	2

This outcome was achieved because of several factors that affected the staff's attitude towards technology. First, a technology plan that was developed which will infuse technology into the curriculum by placing three to five computers into each classroom by September, 1999. Second, reliable Internet access in the media center, computer lab, and social studies classrooms at the practicum site was successfully installed. Third, articles in various educational journals and magazines allowed teachers to learn the success stories of school districts that utilize technology in the curriculum.

These factors combined with the technology inservice and workshop sessions presented by the implementation of this practicum and the reaction is a need for further development of skills as reflected by increase in the number of personal improvement plans that included technology.

Outcome 5 stated that out of 27 teachers who had computers in their classroom, at least 12 will use computers twice a week for instruction.

This outcome was not met.

The circulation statistics collected through the Winnebago computerized circulation management system compiled dates and usage of laptop computers and projection panels. The results provided tangible evidence that laptops and projection devices were not used twice a week by 12 teachers. Projection panels were signed out 5 times during the implementation period, and the laptops were signed out an average of once a week by a total of 10 teachers.

Outcome 6 stated that there will be an increase in teacher Internet access usage from 3 teachers to at least 30 teachers during the implementation period.

This outcome was met.

The results are based on a written log of class sign-up requests to use the Internet, which substantiates that 33 teachers accessed the Internet for class use in the Media center. In addition, 37 out of 45 teachers have activated their e-mail accounts and use e-mail for correspondence.

Discussion

Expected Outcome 1 concerned the utilization of all computers for at least one period a day. The computer monitoring program indicated 27 out of 30 computers were

utilized on a daily basis for at least one period a day or longer. However, this falls short of the predicted outcome to have all available computers utilized for one period per day. One reason the outcome was not met was because several computers needed repairs that required parts that took two months to receive. In addition, some parts were too costly, and a decision was made not to repair those computers. Finally, there are still a few teachers who are not comfortable in teaching with the computer. It is important to realize that just because a teacher can operate a computer, it does not mean they are going to use it. According to Uebbing (1995), training must be a continuing program and teachers must become comfortable before they can utilize computers in the classroom. Therefore, to obtain this outcome, the writer recommends that a staff technology program be developed that can nurture teachers in the fields of computers and technology utilization.

With regard to Outcome 2, the expectations of the classroom management component failed to meet the projected outcome. The expected outcome was specified to include 10 out of 12 teachers, while the actual outcome was 8 out of 8 teachers who can use the computer for classroom management tasks. While the outcome was not obtained, the writer is satisfied with this increase and realized that attendance was affected by the lack of monitory remuneration to attend the

workshop training. It has been a district precedent to provide a stipend for staff training. Consequently, several teachers chose not to participate in the training.

In addition, the district's recent decision to switch computer platforms from Macintosh to PC computers has also affected workshop attendance. Teachers prefer to be trained on the computer that they will be using. Several teachers mentioned that they wanted to wait and be trained on the PC computer. These excuses stem from the fear of change, lack of self confidence, and avoidance. It is substantiated by Yaghi (1996) who believes that there is a connection between a teacher's self-confidence and frequency of computer use. As a result, the teachers who attended the workshops gained confidence in their own computer skills and therefore utilized the computer. The results of this project was substantiated by several studies (Hadley and Sheingold, 1993; Means, 1994; & Persky, 1990) that found that staff training must be a continuous and ongoing activity. The training program at the practicum site must continue, and as it does, teachers will continue to learn how to integrate technology into their classroom lessons. A report to the nation on technology and education from the Department of Education (Riley, Kunin, Smith, & Roberts (1997) stressed the importance of sustaining a technology staff training program.

Consequently, if this program is continued, more teachers will use computers for classroom management tasks.

Outcome 6 demonstrated individual teachers' willingness to include technology infusion as their topic for the State Personal Improvement Plan (PIP). The expected outcome of 12 teachers' including technology in their Person Improvement Plan was met and surpassed with 35 teachers who selected technology for their Personal Improvement objective. The outcome implies that once teachers see the value of technology in education and have developed self-confidence, they are interested in extending their learning experience. These results are also supported from the evaluation forms (see Appendix D) completed by the staff. The results revealed that 42 out of 45 teachers who attended the inservice programs believed the sessions helped them to improve in: a) their ability to utilize a computer, (b) felt better prepared to use one, and (c) thought the material was relevant to their professional responsibilities. This issue is further substantiated by Woodrow (1996) who found that teachers' attitudes about computers change significantly after receiving training. The inclusion of technology in a Personal Improvement Plan is dependent upon on the continuation of teacher training and the implementation into class instruction. This outcome is an extension of the practicum. It provides the anticipated outcome that 35 teachers will

include the utilization of computers for classroom instruction or classroom management in the 1998-99 school year. Moreover, the effects of this practicum can and will continue to motivate teachers in the future.

This practicum did not see the anticipated 12 out of 27 teachers using computers twice daily for instruction. The major problem in reaching this outcome was the one-computer classroom. The LCD panels that the school purchased do not project enough light in the classrooms. Most classrooms do not have shades to block out the sunlight. As a result, the image projected is too light for students to view. To rectify this problem, a scan converter box was purchased that connects the computer to a large TV screen. This provides a clear, dark image that is visible in the classroom. However, there was only one scan converter. Consequently, teachers became discouraged with this situation and did not attempt to use their one computer for classroom instruction. However, the laptop computers were used at a rate of one a week throughout the implementation period. A total of 10 teachers signed them out for overnight use. This provided the teachers with the convenience of working at home with the computer. These results correlate with the work of Leavell, Peterson, Hall, and Caverty (1994) who documented the success achieved by using a laptop with preservice teachers. Laptop computers

provide access for teachers who don't have a computer available to them either at home or in the classroom.

The last outcome that focused on the increase of Internet access was successful for several reasons. First, the installation of ISDN lines in the media center and computer lab provided fast, dependable access. The workshops and inservice sessions provided the teachers with the skills to use the Internet and the knowledge of how to utilize this instruction for classroom use. Finally, providing each teacher with an e-mail account gave the teachers a) a communication tool, b) an incentive to work online, and c) the opportunity to collaborate with other teachers.

According to a nationwide survey of 608 accomplished computer-using teachers, it takes up to 6 years to master computer-based teaching practices and approaches (Sheingold and Hadley, 1990). This practicum has laid the foundation for this 6-year process to occur. It has enabled teachers to increase their use of computers by presenting a series of workshops and inservice sessions that provided teachers with the skills and confidence needed to utilize the computer. The results of computer use was recorded by a monitoring program installed on each computer which substantiated that 25 out of 27 computers were used for at least one period per day. In addition, the results of a software evaluation inservice program were measured by the successful completion of a

software evaluation form by each attendee. A total of 12 teachers included technology on their State Personal Improvement Plans. While 8 out of 8 teachers performed classroom management tasks as verified by a performance checklist. Finally, over 30 teachers use the Internet for class information. These were the actual outcomes of this practicum. The results of the initiation of this staff technology program will have an impact the staff's training needs over the next 5 years as teachers master computer-based teaching practices and approaches

Recommendations

The writer recommends that in any technology-based training program, the technology used for training should be examined before sessions to alleviate potential problems, and at least one or two additional computers are available as a back-up support system. The use of fail-safe measures should be included to circumvent problems and to ensure the trainees' success as well as the program's success.

To project an image from a computer to an entire class, the writer recommends a scan converter box connected to a large screen television or an LCD projector. With either of the two technologies, all students can view the screen, and the classroom lights do not have to be turned off.

In addition, a staff training program must have a budget that includes incentives to motivate teachers to attend

training sessions. The incentive can be a stipend or a computer. If this form of an incentive is not feasible, then the district should create ways to provide release time for teachers to participate in staff training programs.

The writer recommends that the staff training program at the practicum site proceeds with a continuous technology staff training program that provides sessions in which teachers' can produce a useable project for classroom implementation. These sessions should take place at a regular basis during the school year and be offered at a variety of times. The writer also recommends the continuation of the mentoring program.

Dissemination

Staff technology training is a very pertinent concern for numerous school districts in the state and across the country. Therefore, the writer submitted a brief description of this practicum to the 1998 Telecommunications in Education Conference Committee as a presentation proposal. The writer collaborated with a Nova Southeastern classmate whose practicum is based on a similar problem that occurred at the high school level. The session was approved on May 15, 1998, for inclusion as a session at the October, 1998 Telecommunications in Education (Tel. Ed.) Conference. This national technology conference is held at two locations simultaneously in New Orleans, United States and in

Vancouver, Canada. The conference attendance is expected to reach over 10,000 attendees. This presentation will inform attendees of dissemination of the training components and the results from these projects.

During the first month of implementation, the writer presented a summary of this practicum proposal to the Monmouth Technology in Education Council, a county education group sponsored by the County Superintendent's Office and composed of teachers, supervisors, and administrators. The writer extended an open invitation to all Monmouth in Education Council members to observe any of the workshops offered through this practicum. Representatives from four school districts attended sessions. One of these supervisors is interested in initiating training sessions based on the hands-on project concept used in this practicum.

In addition, the writer's district staff leader has expressed interest in expanding this practicum to a district-wide program. Plans have been made for the inclusion of the Internet training component in district-wide training program this summer.

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APPENDIX A

NEEDS ASSESSMENT QUESTIONAIRE

Needs Assessment Questionnaire

TO: Faculty of Barkalow School
FROM: Susanne Flannelly
RE: Respond to Questionnaire
Date: May 26, 1997

Technology Questionnaire

Please take a few minutes to fill out this technology questionnaire and place it in my mailbox by June 5. The purpose of this questionnaire is strictly for personal use. All contents are to be used as documentation for my doctoral practicum.

Please circle or fill in the blank with the answer that best fits your situation.

1. What subject do you teach? _____

2. Do you have a computer in your classroom? _____(If no, skip to question #4)

3. How do you presently us the computer in your classroom? Check all selections that apply and supply the percentage of time used in that capacity.

[] test preparation _____% [] record keeping _____%

[] class instruction ____% [] student use ___%

4. Have you participated in any computer workshops?

YES NO

4a. Did the training provide you with the knowledge and confidence to use the computer for your classroom needs?

YES NO

4b. If so how?_____
_____
_____

5. Please identify your interest level for ALL of the following workshop topics: 1= High Interest 2= Medium Interest 3= Low Interest

[] Desktop Publishing [] Using a Data Base

[] Using Spreadsheets [] Internet Access

[] Software Evaluation

6. Please identify the situation(s) that apply to your use of the Internet by placing an {X} in the appropriate box(es).

[] I have attended Internet training.
[] I use the Internet as a research tool.
[] I have not had the opportunity to use the Internet.

7. In technology, I would like to learn more about?_____

8. I feel my strength in using technology is

_____

9. The best times for me to attend workshops are (check all that apply)

[] Before school(7:15-8:30 AM)

[] After School (3:30-4:45 PM)

[] Evenings (7:15-9:00 PM)

[] Weekends(9:00 AM - 12:00 PM and/or 1:00 - 4:00 PM

Thank you for taking the time to complete this questionnaire.

APPENDIX B

Performance Evaluation Checklist

Performance Evaluation Checklist

Trainee's Name _____

I. Trainee can initiate basic computer operations:

	Yes	No
a. Turn on computer	[]	[]
b. Operate mouse click and drag	[]	[]
c. Use vertical and horizontal scroll bars	[]	[]
Use Pull down menu to:		
d. Open a File	[]	[]
e. Close a File	[]	[]
f. Save a File to disk	[]	[]
g. Create a New File	[]	[]

II. Trainee can construct a letter using a word processing program.

a. Change margins	[]	[]
b. Change fonts	[]	[]
c. Change text style	[]	[]

III. Trainee can construct a database for class lists.

a. create records	[]	[]
b. delete records	[]	[]
c. save file	[]	[]
d. sort records	[]	[]
e. create layout	[]	[]

IV. Trainee can construct a spreadsheet to average student grades.

a. label row and column headings	[]	[]
b. use calculate formula	[]	[]
c. enter data in cells	[]	[]
d. use fill down feature	[]	[]
e. controls alignment	[]	[]

Please submit a printout sample of each application used.

Software Evaluation

Grade/Subject taught_____ November 4, 1997

Software Title_____
Software Subject-area_____

I. Ease of Use - Consider the following: answer yes or no

- After a demonstration lesson can the students operate program independently? _____
- Does the program have a easy accessible help menu? _____
- Is the main menu quick and easy to find? _____
- Are students informed if they made a mistake? _____

This software is _____to use:
(very hard, very easy)

II. Educational Value - Consider the following:

- Does the program offer a good presentation of one or more content areas? _____
- Does the program tie into curriculum content material?_____
- Does the feedback reinforce content? _____
- Is the content free from gender and ethnic bias? _____
- Are the graphics appropriate and do not detract from the program's content? _____

The software is _____educational
(not, somewhat, very)

III. If you had access to several computers would you use this program with your students? (circle one) Yes No

Why?_____
_____
_____

IV. The feature I liked BEST about this program is:

_____
_____
_____

APPENDIX D

WORKSHOP EVALUATION FORM

Workshop Evaluation Form

Please place a check (X) in the box that best indicates how you feel about each statement below. Select SA if you strongly agree, A if you agree, U if you are undecided, D if you disagree, and SD if you strongly disagree

	SA	A	U	D	SD
1. The workshop was relevant to my professional responsibilities.	[]	[]	[]	[]	[]
2. After this activity, I will be better able to use the computer in capacity explained in this workshop.	[]	[]	[]	[]	[]
3. Participation in this workshop activity will improve my ability to utilize a computer.	[]	[]	[]	[]	[]
4. I would participate in future technology workshops offered by this instructor.	[]	[]	[]	[]	[]
5. The instruction met the stated goals and objectives	[]	[]	[]	[]	[]

Please use the area below for any additional comments on this workshop. Comments:

_____

_____